

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A hydrogen generating method for generating hydrogen-containing gas by decomposing fuel containing an organic compound, the method comprising

providing a fuel electrode in contact with one surface of a partition membrane,

supplying fuel containing an organic compound and water to the fuel electrode, and

providing an oxidizing electrode in contact with the other surface of the partition membrane, supplying an oxidizing agent to the oxidizing electrode, wherein fuel containing the organic compound is decomposed and hydrogen-containing gas is generated on the fuel electrode.

2. (Previously Presented) The hydrogen generating method as described in Claim 1 comprising generating the hydrogen-containing gas under open-circuit conditions wherein no electric energy is withdrawn from a hydrogen generating cell constituting a hydrogen generating system, and no electric energy is supplied to the hydrogen generating cell.

3. (Previously Presented) The hydrogen generating method as described in Claim 1 comprising generating the hydrogen-containing gas on the fuel electrode by decomposing fuel containing an organic compound while withdrawing electric energy from the hydrogen generating cell with the fuel electrode serving as a negative electrode and the oxidizing electrode as a positive electrode.

4. (Previously Presented) The hydrogen generating method as described in Claim 1 comprising generating the hydrogen-containing gas on the fuel electrode by decomposing fuel containing the organic compound while providing electric energy to the hydrogen generating cell with the fuel electrode serving as cathode and the oxidizing electrode as anode.

5. (Previously Presented) The hydrogen generating method as described in claim 1 wherein the organic compound is alcohol.

6. (Original) The hydrogen generating method as described in Claim 5 wherein the alcohol is methanol.

7. (Previously Presented) The hydrogen generating method as described in claim 1 wherein the oxidizing agent is gas containing oxygen, or oxygen.

8. (Original) The hydrogen generating method as described in Claim 5 wherein the oxidizing agent is gas containing oxygen, or oxygen.

9. (Previously Presented) The hydrogen generating method as described in claim 1 wherein the oxidizing agent is liquid containing hydrogen peroxide.

10. (Original) The hydrogen generating method as described in Claim 5 wherein the oxidizing agent is liquid containing hydrogen peroxide.

11. (Canceled)

12. (Currently amended) The A hydrogen generating system for generating hydrogen-containing gas by decomposing fuel containing an organic compound, the system comprising:

a partition membrane,

a fuel electrode provided on one surface of the partition membrane,

means for supplying fuel containing an organic compound and water to the fuel electrode,

an oxidizing electrode provided on the other surface of the partition membrane,

means for supplying an oxidizing agent to the oxidizing electrode, and

means for collecting hydrogen-containing gas generated on the fuel electrode and wherein the system is configured to operate in a plurality of configurations wherein one of said configurations comprises an open circuit configuration wherein no current is supplied to either the fuel electrode or the oxidizing electrode, as described in Claim 11 wherein, in the open circuit configuration neither the fuel electrode nor the oxidizing electrode are connected to means for withdrawing electric energy to outside from a hydrogen generating cell constituting the hydrogen generating system, nor means for providing electric energy from outside to the hydrogen generating cell.

13. (Currently amended) The A hydrogen generating system for generating hydrogen-containing gas by decomposing fuel containing an organic compound, the system comprising:

a partition membrane,

a fuel electrode provided on one surface of the partition membrane,

means for supplying fuel containing an organic compound and water to the fuel electrode,

an oxidizing electrode provided on the other surface of the partition membrane,

means for supplying an oxidizing agent to the oxidizing electrode, and

means for collecting hydrogen-containing gas generated on the fuel electrode and wherein the system is configured to operate in a plurality of configurations wherein one of said configurations comprises an open circuit configuration wherein no current is supplied to either the fuel electrode or the oxidizing electrode, as described in Claim 11

wherein, in a first closed circuit configuration the oxidizing electrode and the fuel electrode are connected to means for withdrawing electric energy from the hydrogen generating cell with the fuel electrode serving as a negative electrode and the oxidizing electrode as a positive electrode, and

voltage between the fuel electrode and the oxidizing electrode is adjusted to 200 to 600 mV by varying volume of electric energy withdrawn from the hydrogen generating unit so that evolution volume of the hydrogen-containing gas from the fuel electrode is adjusted.

14. (Currently amended) The A hydrogen generating system for generating hydrogen-containing gas by decomposing fuel containing an organic compound, the system comprising:

a partition membrane,

a fuel electrode provided on one surface of the partition membrane,

means for supplying fuel containing an organic compound and water to the fuel electrode,

an oxidizing electrode provided on the other surface of the partition membrane,

means for supplying an oxidizing agent to the oxidizing electrode, and

means for collecting hydrogen-containing gas generated on the fuel electrode and wherein the system is configured to operate in a plurality of configurations wherein one of said configurations comprises an open circuit configuration wherein no current is supplied to either the fuel electrode or the oxidizing electrode, as described in Claim 11

wherein in a second closed circuit configuration the oxidizing electrode and the fuel electrode are connected to means for providing external electric energy with the fuel electrode serving as cathode and the oxidizing electrode as anode, and

voltage between the fuel electrode and the oxidizing electrode is adjusted to 300 to 1000 mV by varying volume of electric energy provided so that evolution volume of the hydrogen-containing gas from the fuel electrode is adjusted.

15. (Canceled)

16. (Original) The hydrogen generating system as described in Claim 12 wherein voltage between the fuel electrode and the oxidizing electrode is 300 to 800 mV.

17-20. (Canceled)

21. (Currently amended) The hydrogen generating system as described in claim 12 ~~claim 11~~ wherein the evolution volume of hydrogen-containing gas is adjusted by varying the voltage between the fuel electrode and the oxidizing electrode.

22. (Currently amended) The hydrogen generating system as described in claim 12 ~~claim 11~~ wherein voltage between the fuel

electrode and the oxidizing electrode and/or the evolution volume of hydrogen-containing gas are/is adjusted by varying the supply volume of the oxidizing agent.

23. (Currently amended) The hydrogen generating system as described in claim 12 ~~claim 11~~ wherein voltage between the fuel electrode and the oxidizing electrode and/or the evolution volume of hydrogen-containing gas are/is adjusted by varying the concentration of the oxidizing agent.

24-26. (Canceled)

27. (Currently amended) The hydrogen generating system as described in claim 12 ~~claim 11~~ wherein voltage between the fuel electrode and the oxidizing electrode and/or the evolution volume of hydrogen-containing gas are/is adjusted by varying the supply volume of fuel containing an organic compound and water.

28. (Currently amended) The hydrogen generating system as described in claim 12 ~~claim 11~~ wherein voltage between the fuel electrode and the oxidizing electrode and/or the evolution volume of hydrogen-containing gas are/is adjusted by varying the concentration of fuel containing an organic compound and water.

29-31. (Canceled)

32. (Currently amended) The hydrogen generating system as described in claim 12 ~~claim 11~~ wherein the operation temperature is not higher than 100°C.

33. (Original) The hydrogen generating system as described in Claim 32 wherein the operation temperature is between 30 and 90°C.

34-38. (Canceled)

39. (Currently amended) The hydrogen generating system as described in claim 12 ~~claim 11~~ wherein the partition membrane is a proton conducting solid electrolyte membrane.

40. (Original) The hydrogen generating system as described in Claim 39 wherein the proton conducting solid electrolyte membrane is a perfluorocarbon sulfonate-based solid electrolyte membrane.

41-42. (Canceled)

43. (Currently amended) The hydrogen generating system as described in claim 12 ~~claim 11~~ wherein a catalyst applied to the fuel electrode is made of platinum-ruthenium alloy supported by carbon powder serving as a base.

44-46. (Canceled)

47. (Currently amended) The hydrogen generating system as described in claim 12 ~~claim 11~~ wherein a catalyst applied to the oxidizing electrode is made of platinum supported by carbon powder serving as a base.

48-51. (Canceled)

52. (Currently amended) The hydrogen generating system as described in claim 12 ~~claim 11~~ comprising means for circulating fuel containing an organic compound and water.

53-54. (Canceled)

55. (Currently amended) The hydrogen generating system as described in claim 12 ~~claim 11~~ comprising a carbon dioxide absorbing portion for absorbing carbon dioxide contained in the hydrogen-containing gas.

56-57. (Canceled)

58. (New) The hydrogen generating system as described in claim 13 wherein voltage between the fuel electrode and the oxidizing electrode and/or the evolution volume of hydrogen-containing gas are/is adjusted by varying the supply volume of the oxidizing agent.

59. (New) The hydrogen generating system as described in claim 13 wherein voltage between the fuel electrode and the oxidizing electrode and/or the evolution volume of hydrogen-containing gas are/is adjusted by varying the concentration of the oxidizing agent.

60. (New) The hydrogen generating system as described in claim 13 wherein voltage between the fuel electrode and the oxidizing electrode and/or the evolution volume of hydrogen-containing gas are/is adjusted by varying the supply volume of fuel containing an organic compound and water.

61. (New) The hydrogen generating system as described in claim 13 wherein voltage between the fuel electrode and the oxidizing electrode and/or the evolution volume of hydrogen-containing gas are/is adjusted by varying the concentration of fuel containing an organic compound and water.



62. (New) The hydrogen generating system as described in claim 13 wherein the operation temperature is not higher than 100°C.

63. (New) The hydrogen generating system as described in claim 13 wherein the partition membrane is a proton conducting solid electrolyte membrane.

64. (New) The hydrogen generating system as described in claim 13 wherein a catalyst applied to the fuel electrode is made of platinum-ruthenium alloy supported by carbon powder serving as a base.

65. (New) The hydrogen generating system as described in claim 13 wherein a catalyst applied to the oxidizing electrode is made of platinum supported by carbon powder serving as a base.

66. (New) The hydrogen generating system as described in claim 13 comprising means for circulating fuel containing an organic compound and water.

67. (New) The hydrogen generating system as described in claim 13 comprising a carbon dioxide absorbing portion for absorbing carbon dioxide contained in the hydrogen-containing gas.

68. (New) The hydrogen generating system as described in claim 14 wherein voltage between the fuel electrode and the oxidizing electrode and/or the evolution volume of hydrogen-containing gas are/is adjusted by varying the supply volume of the oxidizing agent.

69. (New) The hydrogen generating system as described in claim 14 wherein voltage between the fuel electrode and the oxidizing

electrode and/or the evolution volume of hydrogen-containing gas are/is adjusted by varying the concentration of the oxidizing agent.

70. (New) The hydrogen generating system as described in claim 14 wherein voltage between the fuel electrode and the oxidizing electrode and/or the evolution volume of hydrogen-containing gas are/is adjusted by varying the supply volume of fuel containing an organic compound and water.

71. (New) The hydrogen generating system as described in claim 14 wherein voltage between the fuel electrode and the oxidizing electrode and/or the evolution volume of hydrogen-containing gas are/is adjusted by varying the concentration of fuel containing an organic compound and water.

72. (New) The hydrogen generating system as described in claim 14 wherein the operation temperature is not higher than 100°C.

73. (New) The hydrogen generating system as described in claim 14 wherein the partition membrane is a proton conducting solid electrolyte membrane.

74. (New) The hydrogen generating system as described in claim 14 wherein a catalyst applied to the fuel electrode is made of platinum-ruthenium alloy supported by carbon powder serving as a base.

75. (New) The hydrogen generating system as described in claim 14 wherein a catalyst applied to the oxidizing electrode is made of platinum supported by carbon powder serving as a base.

76. (New) The hydrogen generating system as described in claim 14 comprising means for circulating fuel containing an organic compound and water.

77. (New) The hydrogen generating system as described in claim 14 comprising a carbon dioxide absorbing portion for absorbing carbon dioxide contained in the hydrogen-containing gas.